NORTHERN DESIGN WORKS

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ADDENDUM

Number:	1	Project Number:	1213
Project:	IMVA- Relocate Sleep Lab	Date:	May 20, 2013

The contractor shall acknowledge receipt of all addenda by listing the number where indicated on the bid form.

Drawings, specifications, and / or proposals are herein amended, expanded, and / or modified, and become a part of the Contract Documents with the same effect as if incorporated in the original documents. Any contrary provisions contained, or referred to, in Drawings and / or Specifications, shall remain applicable unless overridden by this Addendum. Revised provisions herein shall include all labor, materials, methods, modifications, etc. required for the completion of the Work.

Specification Modifications:

Specification Section 01 00 00-General Requirements Para 1.6G.1 add the following: The work in Canteen Storage shall be from 7am to 10am and 2:30pm to 4:30pm Monday through Friday.

Specification Section 01 00 00-General Requirements Para 1.19B revise to read:
"B. Contractor shall make arrangements with the COR for use of the service elevator. Contractor may not use elevators for daily use. Elevator usage for material handling shall be after 5:00pm to access the 3rd floor. Elevators #4, and #5 will be under construction for another project. Elevators #1, #2, and #3 will be under construction for another project. The service elevator shall not be used at the designated “lock-out” times noted below:"

Specification Section 01 91 00-General Commissioning Para 1.7 B.1 Revise last sentence to read” “VA will engage the CxA under project contract.

Specification Section 01 91 00-General Commissioning Para 3.8B Revise to read “The Contractor shall provide training and demonstration as required by Division 23 sections.

Specification Section 01 91 00-General Commissioning Para 3.8F.1 Remove a,b,c and rename d to a. Remove e,f,g and rename h as b. Remove i,j,k,l.

Specification Section 22 63 00-Gas Systems for Lab & Healthcare- reissued

Drawing Modifications:

1. Drawing Q100-Third Floor Equipment Plan and Schedule (reissued)
   a. Revise Equipment Schedule as shown on drawings.

Clarifications:

Revise in the Bid Schedule furnished under Solicitation 1 the project duration from 182 days to 120 days.

Removal and replacement of acoustic tile ceilings is required where necessary for plumbing and mechanical work whether shown on Architectural drawings or not.

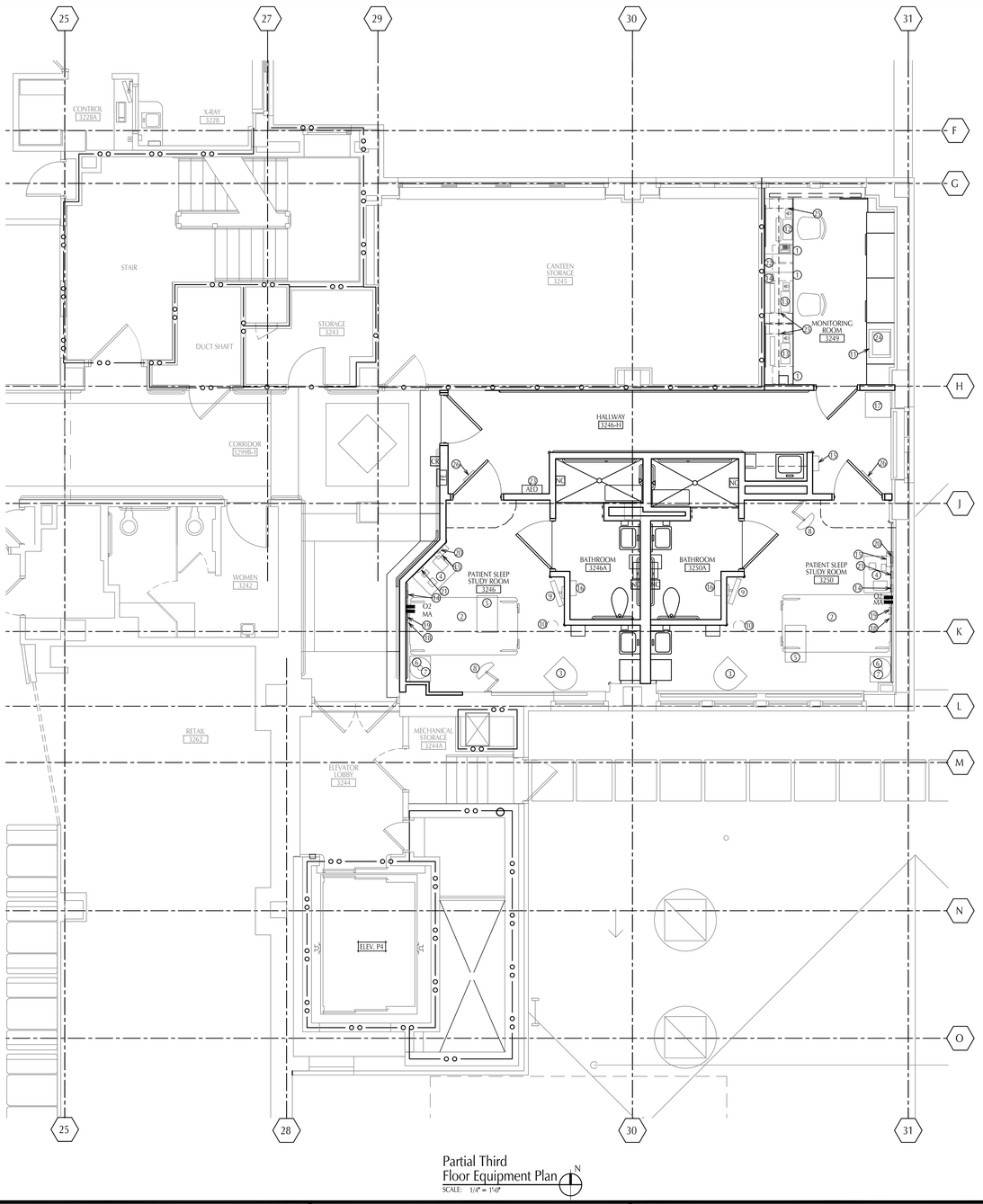
Attachments:

Q100, Specification Section 22 63 00.

End of Addendum

Equipment Schedule

#	Equipment	Quanity	Size	Location	Power	Data	Drain	Gas	Notes	Furn./Install
1	Undercounter file cabinet	3	15"W x 18"D X 28 3/4"H	Monitoring Room					VA to relocate	V.V.
2	Bariatriac Patient Bed	2	50"W x 94"L	Patient Room	X				VA to relocate	V.V.
3	Patient Side Chair	2		Patient Room					VA to relocate	V.V.
4	Casecart w/ VPAP, Amplifier	2	32"W x 23"D x 34"H	Patient Room	X	X			VA to relocate	V.V.
5	Overbed Table	2		Patient Room					VA to relocate	V.V.
6	Bedside Patient Table	2	18"D x 22"W x 30"H	Patient Room					VA to relocate	V.V.
7	Table Lamp	2		Patient Room	X				VA to relocate	V.V.
8	Wall Mounted Fan	2		Patient Room	X				VA to relocate	V.V.
9	Wall Mounted TV	2		Patient Room	X	X			VA to relocate	V.C.
10	Ceiling Mounted Monitoring Camera	2		Patient Room	X	X			See Specification section 11 70 00	C.C.
11	Undercounter Refrigerator	1		Monitoring Room	X					V.V.
12	Desktop PC Station	1		Monitoring Room	X	X			VA to relocate	V.V.
13	Sleep Monitoring Station	2		Monitoring Room	X	X			VA to relocate	V.V.
14	Intercom Station	3		Monitoring Room,Patient Room	X				Contractor to relocate from Rooms 4120, 4116, 4188	V.C.
15	Wall Mounted Glovebox Holder	2		Patient Room					VA to relocate	V.V.
16	Wall Mounted Sharps Container	2		Bathroom					VA to relocate	V.V.
17	Linen Hamper	1		Corridor					VA to relocate	V.V.
18	Intercom Microphone	2		Patient Room					Contractor to relocate from Rooms 4120, 4116	V.C.
19	Head Box Bracket	2		Patient Room					VA to relocate	V.V.
20	Belts Bracket	2		Patient Room					VA to relocate	V.V.
21	Wire Bracket	2		Patient Room					VA to relocate	V.V.
22	Printer	1		Monitoring Room	X	X			VA to relocate	V.V.
23	AED	1		Hallway	X					V.V.
24	Microwave	1		Monitoring Room	X					V.V.
25	PC Holder	3		Monitoring Room					See Specification section 06 20 00	C.C.
26	MRSA Rack	2		Hallway						V.V.



Partial Third Floor Equipment Plan

SCALE: 1/4" = 1'-0"

Keynotes

1. Note.

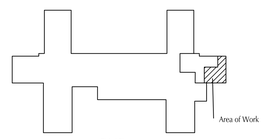
Equipment Schedule Legend

1. V.V. - VA furnished, VA installed.
2. V.C. - VA furnished, contractor installed.
3. C.C. - Contractor furnished, contractor installed.

General Notes

1. Second Floor project area is a Healthcare Occupancy per NFPA 101-2012.
2. Third Floor project area is a Business Occupancy per NFPA 101-2012.
3. Light lines indicate existing construction to remain. Dark lines indicate new work.
4. Field verify all dimensions and clearances prior to beginning of construction.
5. Provide fire retardant treated 2x blocking at all wall mounded equipment and accessories.
6. Floor structure is Two-Hour Rated Concrete Construction. Maintain fire rating and provide firestopping at all penetrations.
7. Work in corridos shall be performed after normal business hours and spaces cleaned and put back into service the same day.
8. Work in Rooms 2247, 2248, 2249, 3245 shall be coordinated with Owner and provide 30 day notice. See Specification 01 00 00-General Requirements for additional information.

Key Plan



Revisions:	Date
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Addendum #1	5/20/2013
100% Construction Documents	4/3/2013
100% Construction Documents	3/21/2013
95% Review	3/14/2013
50% Review	2/21/2013

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NDW PROJECT NUMBER: 1213

Drawing Title: Partial Third Floor Equipment Plan and Schedule

Approved: Project Director

Project Title: Relocate Sleep Lab

Location: IRON MOUNTAIN, MICHIGAN

Date: March 21, 2013 | Checked: RU | Drawn: PW

Project Number: 585-12-126

Building Number: 1

Drawing Number: Q100

Dwg. 10 of 26

Office of Construction and Facilities Management

Department of Veterans Affairs

SECTION 22 63 00
GAS SYSTEMS FOR LABORATORY AND HEALTHCARE FACILITIES

PART 1 - GENERAL

1.1 DESCRIPTION

A. Central Healthcare Gas Systems: Consisting of oxygen, and medical air services; connect from floor valves in 3184A, complete, ready for operation, including all necessary piping, fittings, valves, cabinets, station outlets, rough-ins, gages, and all necessary parts, accessories, connections and equipment. Match existing station outlet and inlet terminal connections.

B. Oxygen System: Existing bulk system to remain.

1.2 RELATED WORK

A. Sealing around pipe penetrations to maintain the integrity of fire rated construction: Section 07 84 00, FIRESTOPPING.

B. General requirements and items common to more than one section of Division 22. Section 22 05 11, COMMON WORK RESULTS FOR PLUMBING.

C. Conduit: Section 26 05 33, RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS.

D. Electrical wiring and accessories: Section 26 27 26, WIRING DEVICES.

1.3 QUALITY ASSURANCE

A. Materials and Installation: In accordance with NFPA 99, most current code and as specified.

B. Equipment Installer: Show technical qualifications and previous experience in installing laboratory and healthcare equipment on three similar projects. Submit names and addresses of referenced projects. Installers shall meet the qualifications of ANSI/ASSE Standard 6010.

C. Equipment Supplier: Show evidence of equivalent product installed at three installations similar to this project that has been in satisfactory and efficient operation for three years. Submit names and addresses where the product is installed.

D. Healthcare System Testing Organization: This contractor shall include testing agency as part of contract. The testing shall be conducted by a party technically competent and experienced in the field of laboratory and healthcare pipeline testing. Testing and systems verification shall be performed by personnel meeting the qualifications of ANSI/ASSE

Standard 6030. Such testing shall be performed by a party other than the installing contractor.

E. Provide names of three projects where testing of medical or laboratory gases systems has been performed by the testing agency. Include the name of the project, names of such persons at that project who supervised the work for the project owner, or who accepted the report for the project owner, and a written statement that the projects listed required work of similar scope to that set forth in this specification.

F. Submit the testing agency's detailed procedure which will be followed in the testing of this project. Include details of the testing sequence, procedures for cross connection tests, outlet function tests, alarm tests, purity tests, etc., as required by this specification. For purity test procedures, include data on test methods, types of equipment to be used, calibration sources and method references.

G. Certification: Provide documentation prior to submitting request for final inspection to include all test results, the names of individuals performing work for the testing agency on this project, detailed procedures followed for all tests, and a certification that all results of tests were within limits allowed by this specification.

H. Installing contractor shall maintain as-built drawings of each completed phases for verification; and, shall provide the complete set at the time of final systems certification testing, for certification by the Third Party Testing Company. As-built drawings shall be provided on prints and in digital format. The digital format shall be in the native CAD system required for the project design. Should the installing contractor engage the testing company to provide as-built or any portion thereof, it shall not be deemed a conflict of interest or breach of the ‘third party testing company’ requirement.

I. “Hot taps” are not permitted for operating medical oxygen systems. Methods for connection and extension of active and pressurized medical gas systems without subsequent medical gas testing and verification are not allowed.

1.4 SUBMITTALS

A. Submit as one package in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.

B. Manufacturer's Literature and Data:

1. Piping.

2. Valves.

3. Inlet and outlet cocks

4. Valve cabinets.

5. Gages.

6. Station outlets and rough-in assemblies.

C. Station Outlets: Submit letter from manufacturer stating that outlets are designed and manufactured to comply with NFPA 99. Outlet shall bear label of approval as an assembly, of Underwriters Laboratories, Inc., or Associated Factory Mutual Research Corporation. In lieu of above labels, certificate may be submitted by a nationally recognized independent testing laboratory, satisfactory to the Contracting Officer, certifying that materials, appliances and assemblies conform to published standards, including methods of tests, of above organizations.

D. Certification: The completed systems have been installed, tested, purged, analyzed and verified in accordance with the requirements of this specification.

1.5 APPLICABLE PUBLICATIONS

A. The publications listed below form a part of this specification to the extent referenced. The publications are referenced in the test by the basic designation only.

B. American Society for Testing and Materials (ASTM):

B819-(R2006).....Seamless Copper Tube for Medical Gas Systems

C. American Society of Mechanical Engineers (ASME):

A13.1-07.....Scheme for Identification of Piping Systems

B16.22-01(R2005).....Wrought Copper and Bronze Solder-Joint Pressure Fittings

B40.100 (2005) .....Pressure Gauges and Gauge Attachments Boiler and Pressure Vessel Code -

Section VIII-07.....Pressure Vessels, Division I

Section IX-07.....Welding and Brazing Qualifications

D. American Welding Society (AWS):

AWS A5.8-04.....Brazing Filler Metal

AWS B2.2-91.....Standard for Brazing Procedure and Performance Qualification (Modified per NFPA 99)

E. Compressed Gas Association (CGA):

C-9-04.....Standard Color Marking of Compressed Gas Cylinders

G-4.1 (2009).....Cleaning Equipment for Oxygen Service

G-10.1(2008) .....Nitrogen, Commodity

P-9-01.....Inert Gases Argon, Nitrogen and Helium

V-1-05.....Standard for Compressed Gas Cylinder Valve Outlet and Inlet Connections

F. National Electrical Manufacturers Association (NEMA):

ICS-6-93(R2006).....Industrial Controls and Systems Enclosures

G. National Fire Protection Association (NFPA):

99-12.....Health Care Facilities

H. United States Pharmacopoeia XXI/National Formulary XVI (USP/NF)

I. Manufacturing Standardization Society (MSS):

MSS-SP-72-99.....Ball Valves With Flanged or Butt Welding For General Purpose

MSS-SP-110-96.....Ball Valve Threaded, Socket Welding, Solder Joint, Grooved and Flared Ends

MSS-SP-73-03.....Brazing Joints for Copper and Copper Alloy Solder Pressure Fittings

PART 2 - PRODUCTS

2.1 PIPING AND FITTINGS

A. Copper Tubing: Type K, ASTM B819, seamless copper tube, hard drawn temper, with wrought copper fittings conforming to ASME B16.22 or brazing fittings complying with MSS SP-73. Size designated reflecting nominal inside diameter. All tubing and fittings shall be labeled "ACR/OXY", "OXY", "OXY/MED", "ACR/MED", or "MED".

B. Brazing Alloy: AWS A5.8, Classification BCuP, greater than 537 °C (1000 °F) melting temperature. Flux is strictly prohibited for copper-to-copper connections.

C. Screw Joints: Polytetrafluoroethylene (teflon) tape.

D. Apply piping identification labels at the time of installation in accordance with current NFPA. Apply supplementary color identification in accordance with CGA Pamphlet C-9.

E. Special Fittings: The following special fittings shall be permitted to be used in lieu of brazed joints:

1. Memory-metal couplings having temperature and pressure ratings joints not less than that of a brazed joint.

2. Listed or approved metallic gas tube fittings that, when made up, provide a permanent joint having the mechanical, thermal, and sealing integrity of a brazed joint.

3. Dielectric fittings where required by the manufacturer of special medical equipment to electrically isolate the equipment from the piping distribution system.

4. Axially swaged, elastic strain preload fittings providing metal to metal seal having pressure and temperature ratings not less than that of a brazed joint and when complete are permanent and non-separable.

2.2 VALVES

A. Ball: In-line, other than zone valves in cabinets:

1. Seventy five millimeter (2 1/2 inches) and smaller: Bronze/ brass body, Fed. Spec. MSS SP72 & SP 110 , Type II, Class 150, Style 1, with tubing extensions for brazed connections, full port, three-piece or double union end connections, teflon seat seals, full flow, 4125 kPa (600 psi) WOG minimum working pressure, with locking type handle, cleaned for oxygen use and labeled for intended service

B. Check:

1. Eighty millimeter (3 inches) and smaller: Bronze/brass body, straight through design for minimum pressure drop, spring loaded, self aligning with teflon cone seat, vibration free, silent operation, supplied NPT female threads at each end with flow direction arrow permanently cast into, cleaned for oxygen use and labeled for intended service, 2750 kPa (400 psi) WOG minimum working pressure.

C. Zone Valve in Cabinet: Ball valve, bronze/ brass body, double seal, three piece or double union end connections, replaceable teflon seat seals, teflon stem seal, 4125 kPa (600 psi) WOG, cold, non-shock gas working pressure service to 100 kPa (29 inch Hg), cleaned for oxygen use and labeled for intended service, blowout proof stem, one quarter turn of handle to completely open or close. Provide tubing extensions factory brazed, and pressure tested. Provide 3 mm (1/8 inch) NPT gauge port for a 50mm (2 inch) diameter monitoring gauge downstream of the shut off valve. Zone valves shall be securely attached to the cabinet and provided with type-K copper tube extensions for making connection to system piping outside the cabinet. Zone valves shall be products of one manufacturer, and uniform throughout in pattern, overall size and appearance. Trim with color coded plastic inserts or color coded stick-on labels. Install valves in cabinets such that cover window cannot be in place when any valve is in the closed position. Color coding for identification plates and labels is as follows:

SERVICE LABEL	IDENTIFICATION COLORS	MFG. STD. CLR.
OXYGEN	White letters on green background	GREEN
MEDICAL AIR	Black or white letters on yellow background	YELLOW

2.3 VALVE CABINETS

A. Flush mounted commercially available item for use with laboratory and healthcare services, not lighter than 1.3 mm (18 gage) steel or 1.9 mm (14 gage) extruded aluminum, rigidly assembled, of adequate size to accommodate valve(s) and fittings. Punch or drill sides to receive tubing. Provide anchors to secure cabinet to wall construction. Seal openings in cabinet to be dust tight. Locate bottom of cabinet 1375 mm (4 foot 6 inches) above floor.

B. Mount engraved rigid plastic identification plate on wall above or adjacent to cabinet. Color code identification plate to match gas identification colors as indicated above. Identification plate must be clearly visible at all times. Provide inscriptions on plate to read in substance: "VALVE CONTROL SUPPLY TO ROOMS."

C. Cover plate: Fabricate from 1.3 mm (18 gage) sheet metal with satin chromed finish, extruded anodized aluminum, or .85 mm (22 gage) stainless steel. Provide cover window of replaceable plastic, with a corrosion resistant device or lever secured to window for emergency window removal. Permanently paint or stencil on window: CAUTION-CLOSE ONLY IN EMERGENCY, SHUT-OFF VALVES FOR PIPED GASES", or equivalent wording. Configure such that it is not possible to install window with any valve in the closed position. Each valve shall have gauge upstream of valve inside valve box.

D. Cabinets and isolation valves shall be located and piped as shown, and at a minimum, so as to allow the isolation of each smoke compartment separately. No cabinet shall serve more than one smoke compartment.

2.4 GAGES

A. Pressure Gages: Includes gages temporarily supplied for testing purposes.

1. For line pressure use adjacent to source equipment: ASME B40.1, pressure gage, single, size 115 mm (4-1/2 inches), for medical air, and oxygen, accurate to within two percent, with metal case. Range shall be two times operating pressure. Dial graduations and figures shall be black on a white background, or white on a black background. Gage shall be cleaned for oxygen use, labeled for appropriate service, and marked "USE NO OIL". Install with gage cock.

2. For all services downstream of main shutoff valve: Manufactured for oxygen use, labeled for the appropriate service and marked "USE NO OIL", 40 mm (1-1/2 inch) diameter gage with dial range 1-690 kPa (1-100 psi) for air service.

2.5 STATION OUTLETS

A. For all services except ceiling hose drops and nitrogen system: For designated service, consisting of a quick coupler and inlet supply tube. Provide coupler that is non-interchangeable with other services, and leak proof under three times the normal working pressure. Equip each

station outlet with an automatic valve and a secondary check valve to conform with NFPA 99. Equip each station inlet with an automatic valve to conform with NFPA 99. Place valves in the assembly to provide easy access after installation for servicing and replacement, and to facilitate line blow-out, purging, and testing. Fasten each outlet and inlet securely to rough-in to prevent floating and provide each with a capped stub length of 6 mm (1/4-inch) (10 mm outside diameter) (3/8-inch outside diameter) tubing for connection to supply. Identification of each gas service shall be permanently cast into the back plate and shall be visible through a transparent plastic guard. Label stub tubing for appropriate service. Rough-in kits and test plugs for Prefabricated Bedside Patient Units (PBPU) are furnished under this specification but installed by manufacturer of PBPUs before initial test specified herein. Install completion kits (valve body and face plate) for the remainder of required tests.

2.6 STATION OUTLET ROUGH-IN

A. Flush mounted, protected against corrosion. Anchor rough-in securely to unit or wall construction.

B. Modular Cover Plate: Die cast back plate, two-piece .85 mm (22 gage) stainless steel or 1.6 mm (16 gage) chromium plated metal, with mounting flanges on all four sides, secured to rough-in with stainless steel or chromium plated countersunk screws.

C. Cover Plate for Prefabricated Bedside Patient Units (PBPU): One-piece with construction and material as indicated for modular cover plate.

D. Provide permanent, metal or plastic, identification plates securely fastened at each outlet and inlet opening, with inscription for appropriate service using color coded letters and background. Metal plates shall have letters embossed on baked-on enamel background. Color coding for identification plates is as follows:

SERVICE LABEL	IDENTIFICATION PLATE COLORS
OXYGEN	White letters on green background
MEDICAL AIR	Black or white letters on yellow

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install cast escutcheon with set screw at each wall, floor and ceiling penetration in exposed finished locations and within cabinets and millwork.

B. Keep open ends of tube capped or plugged at all times or otherwise sealed until final assembly.

C. Cut piping square and accurately with a tube cutter (sawing not permitted) to measurements determined at place of installation. Ream tube to remove burrs, being careful not to expand tube, and so no chips of copper remain in the tube. Work into place without springing or forcing. Bottom tube in socket so there are no gaps between tube and fitting. Exercise care in handling equipment and tools used in cutting or reaming of tube to prevent oil or grease being introduced into tubing. Where contamination has occurred, material is no longer suitable for oxygen service.

D. Spacing of hangers: Current NFPA.

E. Rigidly support valves and other equipment to prevent strain on tube or joints.

F. While being brazed, joints shall be continuously purged with *oil* free nitrogen. The flow of purged gas shall be maintained until joint is cool to touch.

G. Do not bend tubing. Use fittings.

H. Support ceiling column assembly from heavy sub-mounting castings furnished with the unit as part of roughing-in. Anchor with 15 mm (1/2-inch) diameter bolts attached to angle iron frame supported from structural ceiling, unless otherwise indicated.

I. Provide two 25 mm (1 inch) minimum conduits from ceiling column assembly to adjacent corridor, one for mass spectrometer tubing and wiring and one for monitor wiring, for connection to signal cabling network.

J. Install pressure switches, transmitter and gauges to be easily accessed, and provide access panel where installed above plaster ceiling. Install pressure switch and sensors with orifice nipple between the pipe line and switches/sensors.

K. Apply pipe labeling during installation process and not after installation is completed. Size of legend letters shall be in accordance with ANSI A13.1.

L. Pipe compressor intake to a source of clean ambient air as indicated in current NFPA.

M. After initial leakage testing is completed, allow piping to remain pressurized with testing gas until testing agency performs final tests.

N. Penetrations:

1. Fire Stopping: Where pipes pass through fire partitions, fire walls, smoked partitions, or floors, install a fire stop that provides an effective barrier against the spread of fire, smoke and gases as specified in Section 07 84 00, FIRESTOPPING, with intumescent materials only. Completely fill and seal clearances between raceways and openings with the fire stopping material.

O. Provide 40mm (1 1/2 inch) diameter line pressure gage downstream of zone valve in cabinets.

P. Provide zone valves in cabinet where indicated and outside rooms and a minimum one zone valve assembly for each 18 outlet set.

3.2 TESTS

A. Initial Tests: Blow down, and high and low pressure leakage tests as required by current NFPA with documentation.

B. Laboratory and healthcare testing agency shall perform the following:

1. Perform and document all cross connection tests, labeling verification, supply system operation, and valve and alarm operation tests as required by, and in accordance with, current NFPA and the procedures set forth in pre-qualification documentation.

2. Verify that the systems, as installed, meet or exceed the requirements of current NFPA, this specification, and that the systems operate as required.

3. Piping purge test: For each positive pressure gas system, verify cleanliness of piping system. Filter a minimum of 35 cubic feet (1000 liters) of gas through a clean white 0.45 micron filter at a minimum velocity of 3.5 scfm (100 Lpm). Filter shall show no discoloration,

and shall accrue no more than 0.1 mg of matter. Test each zone at the outlet most remote from the source. Perform test with the use of an inert gas as described in CGA P-9.

4. Piping purity test: For each positive pressure system, verify purity of piping system. Test each zone at the most remote outlet for dew point, carbon monoxide, total hydrocarbons (as methane), and halogenated hydrocarbons, and compare with source gas. The two tests must in no case exceed variation as specified in Paragraph, Maximum Allowable Variation. Perform test with the use of an inert gas as described in CGA P-9.

5. Outlet and inlet flow test:

   a. Test all outlets for flow. Perform test with the use of an inert gas as described in CGA P-9.

   b. Oxygen, and air outlets must deliver 100 Lpm (3.5 scfm) with a pressure drop of no more than 35 kPa (5 psi), and static pressure of 350 kPa (50 psi).

   c. Needle valve air outlets must deliver 1.5 scfm with a pressure drop of no more than five psi, and static pressure of 350 kPa (50 psi).

6. Source Contamination Test: Analyze each pressure gas source for concentration of contaminants, by volume. Take samples for air system test at the intake and at a point immediately downstream of the final filter outlet. The compared tests must in no case exceed variation as specified in Paragraph, Maximum Allowable Variation. Allowable concentrations are below the following:

Dew point, air	4 degrees C (39 degrees F) pressure dew point at 690 kPa (100 psi)
Carbon monoxide, air	10 mg/L (ppm)
Carbon dioxide, air	500 mg/L (ppm)
Gaseous hydrocarbons as methane, air	25 mg/L (ppm)
Halogenated	2 mg/L (ppm)

hydrocarbons, air	

7. Analysis Test:

   a. Analyze each pressure gas source and outlet for concentration of gas, by volume.

   b. Make analysis with instruments designed to measure the specific gas dispensed.

   c. Allowable concentrations are within the following:

      1) Laboratory air 19.5 percent to 23.5 percent oxygen.

Oxygen	>=97 plus percent oxygen
Medical air	19.5 percent to 23.5 percent oxygen

8. Maximum Allowable Variation: Between comparative test results required are as follows:

Dew point	2 degrees C (36 degrees F)
Carbon monoxide	2 mg/L (ppm)
Total hydrocarbons as methane	1 mg/L (ppm)
Halogenated hydrocarbons	2 mg/L (ppm)

3.3 DEMONSTRATION AND TRAINING

A. Provide services of manufacturer’s technical representative for one hour to instruct VA Personnel in operation and maintenance of units.

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